

The morning reports of September 8 showed the storm to be central southeast of St. Kitts and a maximum wind velocity of 30 miles was reported, the only high wind.

The following was received from Washington at 11:59 a.m.:

Hurricane signal has been ordered at St. Kitts; storm central east of that island apparently moving northwest.

Advisory messages had been sent direct to all stations from Washington, and the usual disposition of such messages was made locally. The morning reports of September 9 showed the storm center to the northeast of Porto Rico, and conditions indicated the passing of the hurricane to the north-northwest. By the morning of the 10th the hurricane had progressed so far northward that all West Indian stations were beyond its influence.—*W. B. Stockman, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

During September there were nine highs and ten lows sufficiently well defined to have their paths traced on Charts I and II.

The accompanying table presents the principal points regarding the first and last appearance, and velocity of these conditions, and the following statement is added:

Movements of centers of areas of high and low pressure.

Number.	First observed.		Last observed.		Path.		Average velocities.			
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length. Miles.	Duration. Days.	Daily. Miles.	Hourly. Miles.
High areas.										
I.....	o	o	o	o	o	o				
I.....	1, a.m.	47	129	5, p.m.	45	59	3,300	4.5	733	30.5
II.....	3, a.m.	36	123	11, a.m.	47	59	4,680	8.0	585	24.4
III.....	4, p.m.	54	117	8, p.m.	32	79	3,240	4.0	810	33.7
IV.....	8, p.m.	48	120	18, a.m.	41	68	3,440	9.5	362	15.1
V.....	11, p.m.	40	126	17, p.m.	34	101	3,900	6.0	650	27.1
VI.....	17, a.m.	51	116	23, a.m.	36	83	3,790	6.0	690	26.3
VII.....	20, a.m.	49	113	25, a.m.	47	65	2,820	5.0	564	23.5
VIII.....	20, p.m.	47	127	29, p.m.	46	57	4,440	9.0	498	20.5
IX.....	26, p.m.	42	126	*5, a.m.	38	73	4,260	8.5	251	10.4
Total.							38,860	60.5	5,078	211.5
Mean of 9 paths.							3,762	.....	564	23.5
Mean of 60.5 days.							560	23.8		
Low areas.										
I.....	*90, p.m.	46	123	5, a.m.	48	51	3,540	5.5	644	26.8
II.....	2, p.m.	44	119	7, a.m.	48	55	3,840	4.5	853	34.5
III.....	4, a.m.	48	128	9, a.m.	49	53	3,480	5.0	606	29.0
IV.....	8, p.m.	50	114	12, a.m.	41	70	2,520	8.5	720	30.0
V.....	10, p.m.	54	106	14, p.m.	46	57	3,600	4.0	915	35.1
VI.....	11, p.m.	47	121	14, p.m.	40	103	1,440	3.0	480	20.0
VII.....	14, p.m.	58	112	17, p.m.	48	75	2,040	8.0	680	28.3
VIII.....	17, p.m.	27	84	21, p.m.	51	64	2,340	4.0	585	24.4
IX.....	21, p.m.	53	116	27, a.m.	48	70	3,480	5.5	638	26.4
X.....	25, p.m.	55	116	30, p.m.	50	68	2,460	5.0	492	20.5
Total.							28,800	43.0	6,698	279.0
Mean of 10 paths.							2,880	.....	670	27.9
Mean of 49.0 days.							670	27.9		

*October.

+August.

Highs.—Numbers II, V, and IX were first noted on the middle Pacific coast; Nos. I, IV, and VIII, on, or near the north Pacific coast, and the remaining three to the north of Montana. The general tendency of the paths is toward the east, or south of east. No. V was last seen in the panhandle of Texas; No. VI in east Tennessee; No. III off the south Atlantic coast; Nos. IV and IX off the middle Atlantic coast; the remaining highs disappeared near Newfoundland. An interesting fact connected with these highs is the very large number of days covered by them, 60.5. This is the largest number of days noted in the past three years.

Lows.—Of the lows, Nos. I, II, III, and VI were the first noted on or near the north Pacific coast; No. VIII was first

seen off the west coast of Florida; the remaining storms moved east or northeast, and all were last seen over Newfoundland or near the mouth of the St. Lawrence, except No. IV, which disappeared off the middle Atlantic coast. The month was remarkable for its light winds. On the p. m. of 11th, as storm No. V approached the lower lakes, New York reported an easterly gust of 60 miles an hour. On the afternoon of 24th, while storm No. IX was over Lake Huron, Cleveland reported a southeast wind of 40 miles, and the next morning Buffalo had a south wind of 48 miles. On the morning of 28th, as storm No. X approached the upper lakes, Chicago reported a west wind of 48 miles; as the same storm passed down the St. Lawrence Valley on the evening of 30th, it caused a northwest wind of 42 miles at New York City.—*H. A. Hazen, Professor.*

RIVERS AND FLOODS.

The low water season is at hand, and the river stages as a rule steadily declined throughout the month. There was a temporary sharp rise in the rivers of the South Atlantic States on the 11th and 12th, due to heavy local rains, but nothing of interest transpired.

The highest and lowest water, mean stage, and monthly range at 123 river stations are given in the accompanying table. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Forecast Official.*

Heights of rivers referred to zeros of gages, September, 1899.

Stations.	Distance to month of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>Mississippi River.</i>								
St. Paul, Minn.	1,954	14	7.5		1	4.5	30	5.6 3.0
Reads Landing, Minn.	1,884	12	4.7	2,3	2.2	30	3.5	2.5
La Crosse, Wis.	1,819	12						
North McGregor, Iowa.	1,750	18	4.9	6-8	3.1	30	4.2	1.8
Dubuque, Iowa.	1,690	15	4.6	7-9	3.1	30	4.0	1.5
Leola, Iowa.	1,600	10	2.6	10-12	1.7	1	2.8	0.9
Davenport, Iowa.	1,588	15	3.7	10,11	2.6	1	3.3	1.1
Muscatine, Iowa.	1,582	16	4.7	10,11	3.2	1	4.2	1.5
Galland, Iowa.	1,473	8	1.8	11-15	1.1	1	1.6	0.7
Keokuk, Iowa.	1,463	14	2.8	12,18	1.5	1,2	2.3	1.8
Hannibal, Mo.	1,402	17	8.8	(18-16)	2.4	1,2	3.4	1.4
Grafton, Ill.	1,306	23	4.8	20	3.2	1,2	4.1	1.6
St. Louis, Mo.	1,264	30	7.5	1,2	5.0	29,30	6.3	2.5
Chester, Ill.	1,180	36	5.3	1-3	3.2	30	4.8	2.1
Memphis, Tenn.	848	33	5.5	1	2.2	30	3.8	3.3
Helena, Ark.	767	42	9.2	1	4.6	30	6.0	4.6
Arkansas City, Ark.	635	42	10.0	1	4.0	28-26,30	5.6	6.0
Greenville, Miss.	595	42	8.5	1	3.7	30	5.2	4.8
Vicksburg, Miss.	474	45	9.6	1	2.8	30	4.5	7.8
New Orleans, La.	108	16	4.6	1	3.8	21,20,30	3.9	1.8
<i>Missouri River.</i>								
Bismarck, N. Dak.	1,309	14	8.7	1	2.0	28-20	2.8	1.7
Pierre, S. Dak.	1,114	14	4.8	1	2.5	28	3.3	1.8
Sioux City, Iowa.	784	19	7.9	2	5.0	29	6.0	2.9
Omaha, Nebr.	669	18	8.4	1,3	6.7	30	7.6	1.7
Plattsmouth, Nebr.	641							
St. Joseph, Mo.	481	10	4.3	1	1.2	30	2.5	3.1
Kansas City, Mo.	388	21	10.0	1	5.9	30	7.6	4.1
Boonville, Mo.	198	20	9.8	1	5.7	30	7.0	8.6
Hermann, Mo.	103	24	8.6	1	5.8	30	6.7	8.8
<i>Illinois River.</i>								
Peoria, Ill.	135	14	4.3	18,19	3.7	1-3,5	4.0	0.6
<i>Youghiogheny River.</i>								
Confluence, Pa.	59	10	4.4	12	0.4	7	1.3	4.0
West Newton, Pa.	15	23	4.5	12	0.1	6-8	0.8	4.4
<i>Allegheny River.</i>								
Warren, Pa.	177	7	0.8	2	0.0	7-30	0.0	0.3
Oil City, Pa.	423	13	1.4	3	-0.1	1	0.3	1.5
Parkers Landing, Pa.	73	20	1.8	2	0.0	1	0.7	1.8
<i>Monongahela River.</i>								
Weston, W. Va.	161	18	-0.6	{12,18}	-1.6	10	-1.1	1.0
Fairmont, W. Va.	119	25	0.8	{13,14}	0.2	1-7	0.5	0.6
Greensboro, Pa.	81	18	9.2	11	6.4	1-3,6-8	6.8	2.8
Lock No. 4, Pa.	40	28	11.0	12	6.1	1,21,22	7.7	4.9

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.				Lowest water.				Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.	Height.	Date.	Height.	Date.		
<i>Conemaugh River.</i> Johnstown, Pa.	Miles. 64	Feet. 7	2.4	12	1.3	7, 8, 18, 19, 24, 25, 30	1.4	1.3				
<i>Red Bank Creek.</i> Brookville, Pa.	35	8	1.4	2	- 0.2		0.3	1.6				
<i>Beaver River.</i> Ellwood Junction, Pa.	10	14	- 0.1	3, 4, 6, 8, 9, 11-13	- 0.3	16-18, 23-25	- 0.2	0.2				
<i>Great Kanawha River.</i> Charleston, W. Va.	61	30	7.0	5, 6, 18, 17, 18	6.4	20	6.8	6.6				
<i>New River.</i> Hinton, W. Va.	95	14	2.3	21, 22	1.1	18, 19	1.4	1.1				
<i>Cheat River.</i> Rowlesburg, W. Va.	36	14	2.4	13	1.0	21, 24-26, 28-30	1.5	1.4				
<i>Ohio River.</i> Pittsburg, Pa.	900	22	7.6	12	2.6	3	5.7	5.0				
Davis Island Dam, Pa.	900	25	6.5	12	1.6	23	2.8	4.9				
Wheeling, W. Va.	875	36	5.9	13, 14	1.0	26	2.6	4.9				
Parkersburg, W. Va.	785	36	6.8	15	1.9	27	3.4	4.9				
Point Pleasant, W. Va.	703	39	4.4	16	1.5	30	2.7	2.2				
Catlettsburg, Ky.	651	50	4.7	18	1.3	30	2.8	3.4				
Portsmouth, Ohio	612	50	6.1	18	2.3	1	3.9	3.8				
Cincinnati, Ohio	499	50	7.0	20	3.7	3.4	5.1	3.3				
Louisville, Ky.	967	23	5.3	24, 25	2.8	5.6	3.6	3.0				
Evansville, Ind.	154	35	3.6	25	1.9	10	2.8	1.7				
Paducah, Ky.	47	40	2.1	1	1.1	16, 17	1.4	1.0				
Cairo, Ill.	1,073	45	7.6	1	4.9	30	6.0	2.7				
<i>Muskogee River.</i> Zanesville, Ohio	70	20	6.1	5	5.6	17	5.8	0.5				
<i>Miami River.</i> Dayton, Ohio	69	18	1.2	20	0.6	30	0.9	0.6				
<i>Wabash River.</i> Mount Carmel, Ill.	50	15	0.8	1	0.3	30	0.5	0.5				
<i>Licking River.</i> Falmouth, Ky.	30	25	0.5	9-19, 30	0.3	23-28	0.4	0.2				
<i>Clinch River.</i> Speers Ferry, Va.	156	20	0.0	11	- 0.6	1, 5, 6, 18	- 0.4	0.6				
Clinton, Tenn.	46	25	3.6	15	- 2.0	25, 26	2.8	1.6				
<i>Tennessee River.</i> Knoxville, Tenn.	614	28	1.0	2	- 0.7	19	- 0.2	1.7				
Kingston, Tenn.	534	25	0.6	1, 2, 3, 24	0.3	18-20, 28-30	0.4	0.3				
Chattanooga, Tenn.	430	33	3.1	4	1.0	21, 22	1.7	2.1				
Bridgeport, Ala.	390	24	1.5	5	0.1	23, 24	0.6	1.4				
Florence, Ala.	220	16	0.9	7, 8	- 0.1	26	0.8	1.0				
Riverton, Ala.	190	25	0.3	8	- 1.8	25-27	- 1.0	2.1				
Johnsonville, Tenn.	94	21	1.6	9	0.1	29, 30	0.7	1.5				
<i>Cumberland River.</i> Burnside, Ky.	434	50	0.3	1	- 0.7	24	- 0.4	0.9				
Carthage, Tenn.	257	40	0.7	1	- 0.1	13-15, 17, 18	0.2	0.8				
Nashville, Tenn.	175	40	1.3	1, 9	0.6	15-28	0.8	0.7				
<i>Arkansas River.</i> Wichita, Kans.	720	10	2.4	10	1.5	7	1.9	0.9				
Webbers Falls, Ind. T.	407	23	1.8	1	1.4	12-20	1.5	0.4				
Fort Smith, Ark.	345	22	3.0	1, 2, 24	1.9	17-23	2.4	1.1				
Dardanelle, Ark.	250	21	2.4	1	1.4	21	1.8	1.0				
Little Rock, Ark.	170	23	3.8	1	2.8	22, 23	3.2	1.0				
<i>White River.</i> Newport, Ark.	150	26	1.5	1, 20	0.9	30	1.2	0.6				
<i>Yazoo River.</i> Yazoo City, Miss.	80	25	- 0.2	1	- 2.2	28-30	- 1.6	2.0				
Arthur City, Tex.	688	27	8.5	24	5.4	15, 16	6.5	3.1				
Fulton, Ark.	565	23	6.6	28	2.7	20, 21	4.0	3.9				
Shreveport, La.	449	29	1.8	1	- 0.3	24	0.8	2.0				
Alexandria, La.	139	33	0.8	1	- 2.0	28-30	- 1.0	2.8				
<i>Osage River.</i> Camden, Ark.	340	39	3.1	1, 2	2.7	30	2.9	0.4				
Monroe, La.	100	40	0.5	1-14	0.0	28-30	0.3	0.5				

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.				Lowest water.				Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.	Height.	Date.	Height.	Date.		
<i>Atchafalaya Bayou.</i> Melville, La.	Miles. 100*	Feet. 31	11.2	1	3.1	30	5.7	8.1				
<i>Susquehanna River.</i> Wilkesbarre, Pa.	178	14	0.0	1, 2	- 2.0	19-24	- 1.2	2.0				
Harrisburg, Pa.	70	17	1.8	1	0.6	19	1.0	1.2				
<i>W. Br. of Susquehanna.</i> Williamsport, Pa.	35	20	1.5	2-5	0.3	23-23	0.8	1.2				
<i>Juniata River.</i> Huntingdon, Pa.	80	24	5.0	12	3.0	1-11, 14-30	3.1	2.0				
<i>Potomac River.</i> Harpers Ferry, W. Va.	170	16	2.0	13	0.9	10, 11	1.3	1.1				
<i>James River.</i> Lynchburg, Va.	257	18	2.6	20	0.1	3-8, 15-19	0.4	2.5				
Richmond, Va.	110	12	0.8	11	- 2.8	29	- 1.2	3.6				
<i>Roanoke River.</i> Weldon, N. C.	90	40	15.5	22	7.3	19, 20	8.1	8.9				
<i>Cape Fear River.</i> Fayetteville, N. C.	100	38	5.7	12	1.4	7	2.7	4.3				
<i>Lumber River.</i> Fairbluff, N. C.	10	6	1.4	14	0.1	9, 10	0.7	1.3				
<i>Edisto River.</i> Edisto, S. C.	75	6	4.7	2	1.4	30	2.9	3.3				
<i>Pedee River.</i> Cheraw, S. C.	145	27	6.9	12	1.0	23-30	1.8	5.9				
<i>Black River.</i> Kingstree, S. C.	60	12	3.5	19-23, 29	1.8	1	3.0	2.2				
<i>Lynches Creek.</i> Effingham, S. C.	35	12	4.8	17	2.5	1, 9, 28, 30	3.2	3.3				
<i>Santes River.</i> Stephens, S. C.	50	12	6.8	17	0.0	30	3.8	6.8				
<i>Congaree River.</i> Columbia, S. C.	37	15	4.5	12	- 0.2	17	0.6	4.7				
<i>Wateree River.</i> Camden, S. C.	45	24	18.8	12	3.0	26	5.4	15.8				
<i>Waccamaw River.</i> Conway, S. C.	40	7	4.0	1, 2	1.2	30	2.6	2.8				
<i>Savannah River.</i> Calhoun Falls, S. C.	347	.....	8.0	(1, 8, 9, 12, 18)	2.2	30	2.8	0.8				
Augusta, Ga.	268	32	13.9	1	3.9	18	6.7	10.0				
<i>Broad River.</i> Carlton, Ga.	30	.....	3.8	1	1.9	24, 25, 29, 30	2.2	1.9				
<i>Flint River.</i> Albany, Ga.	80	20	0.6	5, 6, 18, 19	- 0.5	28-30	0.2	1.1				
<i>Chatahoochee River.</i> West Point, Ga.	239	20	2.5	1, 17	1.1	24	2.0	1.4				
<i>Coosa River.</i> Rome, Ga.	225	30	3.4	1	0.4	30	1.1	3.0				
Gadsden, Ala.	144	18	2.9	2	- 0.8	29, 30	0.0	3.7				
<i>Alabama River.</i> Montgomery, Ala.	265	35	3.1	1	- 0.3	29, 30	0.9	3.4				
Seima, Ala.	212	35	4.8	4	- 1.1	29, 30	1.2	5.9				
<i>Tombigbee River.</i> Columbus, Miss.	285	33	- 1.8	1	- 8.8	11, 13, 29, 30	- 3.4	2.5				
Demopolis, Ala.	155	35	0.0	1	- 8.2	28-30	- 2.4	3.2				
<i>Black Warrior River.</i> Tuscaloosa, Ala.	90	38	1.2	1	- 1.4	30	- 0.6	2.6				
<i>Columbia River.</i> Umatilla, Oreg.	270	25	9.8	1	6.7	30	7.9	2.6				
The Dalles, Oreg.	166	40	14.5	1	10.0	30	11.9	4.5				
<i>Willamette River.</i> Albany, Oreg.	99	20	2.5	1, 4-7	1.4	27-30	1.9	1.1				
Portland, Oreg.	10	15	7.6	1	8.8	28	5.7	3.8				
<i>Sacramento River.</i> Red Bluff, Cal.	241	23	- 0.9	1-30	- 0.9	29, 30	- 0.9	0.0				
Sacramento, Cal.	70	25	7.8	1-5	7.6	29, 30	7.7	0.2				

* Distance to Gulf of Mexico.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

Alabama.—The mean temperature was 72.7° , or 1.9° below normal; the highest was 104° , at Riverton on the 6th, and the lowest, 30° , at Newburg on the 28th. The average precipitation was 0.66, or 2.24 below normal; the greatest monthly amount, 2.80, occurred at Daphne, while none fell at Talladega and Warrior. The first killing frost of the season occurred in some northern counties from the 27th to the 30th, causing damage to late cotton and minor crops.—*F. P. Chaffee.*

Arizona.—The mean temperature was 80.0° , or 4.0° above normal; the highest was 118° , at Texas Hill on the 2d, and the lowest, 32° , at Snowflake on the 30th. The average precipitation was 0.80, or 0.48 below normal; the greatest monthly amount, 5.03, occurred at Pinal Ranch, while none fell at several stations.—*W. G. Burns.*

Arkansas.—The mean temperature was 71.9° , or 1.5° below normal; the highest was 109° , at Conway on the 3d, and the lowest, 28° , at Corning on the 29th. The average precipitation was 1.21, or 2.19 below normal; the greatest monthly amount, 3.00, occurred at Hot Springs, and the least, trace, at Dardanelle and Luna Landing.—*E. B. Richards.*

California.—The mean temperature for the State, obtained by weighting the reports from 295 stations, so that equal areas have about the same weight, was 70.9° , or 2.0° above normal, as determined from 208 records; the highest was 122° , at Ogilby, San Diego County, on the 12th, and the lowest, 18° , at Bodie, Mono County, on the 16th. The